REGULATING THE QUALITY OF PUBLIC UTILITY SERVICE

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The popular conception of the usefulness of a public utility commission and of the relative importance of its various functions is undergoing a change. Occasionally these bodies are spoken of as "rate commissions," but as they become more thoroughly established, it becomes apparent that rate regulation is not their only important function. Thus far it has only been possible to revise rates by making rather elaborate investigations of the individual utilities concerned, and consequently relatively few people have been benefited by rate revisions during the first few years under commission regulation. In any large group of utilities some will be found where rate wars or other conditions have brought about abnormally low rates. These utilities are naturally among the first to apply for readjustment and thus the general effect of the first few years' work measured by rate reductions alone is often rather discouraging to those advocating commission regulation of public utilities. The authority of commissions to regulate the quality of service furnished by the utilities gives an opportunity to benefit practically all consumers of public utility service from the first. The service is improved from the time the utilities and commission's staff begin discussing and considering standards of service. Where the quality of service is not regulated, a reduction in rates may be followed by a reduction in quality of service and in this way the commission's order may be even worse than valueless. Reduction in gas rates could be counteracted or more than counteracted by a reduction in heat value.

The laws in many states give the commissions authority to regulate the service furnished by public utilities, but some prescribe, to a greater or less extent, the quality of service to be furnished and the methods to be employed by the commission in order to maintain this service. Perhaps the most common example of this feature in a public utilities law is that of requiring the commission to test

and seal each gas meter before it can be used in the state. A more effective method and one which has many advantages is to give the commission authority to ascertain and fix standards of service, as is embodied in the Wisconsin law.[1] This not only permits a careful study of conditions and requirements before standards are adopted, but also allows revisions to be made from time to time to take advantage of the progress in manufacture, utilization, regulation and testing.

In administering a law regulating the quality of service of public utilities, two general methods may be employed. The commission may do all the testing and inspecting or it may require the utilities to make inspections and tests which will be supplemented by tests and supervision by the commission. This latter method is much more efficient and satisfactory to all concerned. The utilities can test their own meters more cheaply than the commission can test them, and can check up pressure conditions with the extending of the system and variations in load that are bound to take place.

There are many advantages in having the service inspected by some one who is not actually assisting in furnishing the service. There are also many advantages in connection with the traveling about from one city to another, giving each operator the advantage of the experience of many others in dealing with much the same problems. Many of the smaller utilities and municipalities could not afford local inspectors or complete testing equipment. In the large cities, however, this is not the case. In the smaller municipalities the only people familiar with public utility operation are those connected with the public utility itself. Where the state organizes a technical staff to take care of the service of a few hundred public

[1] Sec. 1797m-2. The Railroad Commission of Wisconsin is vested with power and jurisdiction to supervise and regulate every public utility in this state and to do all things necessary aud convenient in the exercise of such power and jurisdiction.

Sec. 1797m-23. The commission shall ascertain and fix adequate and serviceable standards for the measurement of quality, pressure, initial voltage or other condition pertaining to the supply of the product or service rendered by any public utility and prescribe reasonable regulations for examination and testing of such product or service and for the measurement thereof.

It shall establish reasonable rules, regulations, specifications and standards to secure the accuracy of all meters and appliances for measurements, and every public utility is required to carry into effect all orders issued by the commission relative thereto.

utilities, a high grade of work can be expected with but slight expense for each city affected. Carrying this a step further, however, and regulating the service of all utilities in the country from one central bureau or depar ment decreases the effectiveness as well as the economy and gives such a wide diversity of conditions of the manufacture and utilization that uniform service rules would probably be impracticable. In some sections of the country natural gas is used almost exclusively, while in others it is not used at all. In some states open flame burners for illumination are common, while in others they are seldom found. In some localities gas is used principally for fuel and in others principally for illumination. It therefore appears to the writer that the state is the logical authority to regulate the quality of service furnished by the public utilities, and it is hoped that the following discussion will demonstrate this fact.

The general methods employed by the Wisconsin commission in administering that portion of the public utilities law which relates to the quality of service may be of interest. Here the general plan of procedure is begun with a preliminary study of the operating conditions and the quality of service already being furnished, together with an analysis of the complaints received from consumers in regard to their service. A public hearing is then called and all interested parties are given an opportunity to discuss the various elements which go to make up adequate service, and in some instances to discuss a tentative set of rules, covering these matters, which has been prepared by the commission's engineers. Before the commission's order is issued establishing standards of service in the form of definite rules, the utilities have begun to examine the service they are furnishing and to study the demands of adequate service. With the issuing of the order, the utilities begin making specific tests and keeping prescribed records and the commission's inspectors travel about the state unannounced to determine the degree with which each utility complies with the standards in force, and to examine its records. This commission has jurisdiction over all utilities furnishing gas, electric, telephone, telegraph, water, heating or transportation service. The commission regulating railroads was given authority to regulate all the public utilities in 1907. During the latter part of that year inspection and study were begun with regard to the quality of gas service then being furnished in the state,

which was followed and supplemented by investigations of gas and electric service usually in connection with formal and informal complaints before the commission. In the spring of 1908 a public hearing was conducted at which standards for gas and electric service were discussed, and in July, 1908, a formal order was issued establishing standards for gas and electric service. With the establishing of these standards the number of inspectors was increased and all plants in the state visited from one to six times a year, depending upon the conditions observed.

These standards of gas and electric service were administered with but few exemptions and modifications, until August, 1913, when they were superseded by a revised set of rules. Under this revision more of the detail work is carried on by the utilities, including the tabulation of certain phases of their testing work. Several changes have been made regarding the methods of testing electricity meters. Standards for telephone service have been discussed in conventions and in a public hearing, but the formal order of the commission establishing these standards has not yet been issued. The service of other public utilities has been investigated in connection with complaints, but as yet no formal standards have been adopted governing service other than gas or electric.

Gas utilities in Wisconsin are required to keep their meters correct to within 2 per cent and to test each meter before it is installed and at least once every four years. The complete original record must be kept of every gas meter test and proper precautions taken to insure accurate and reliable testing. Consumers may have their meters tested by requesting the utility to do so provided such test is not requested oftener than once in six months. Where consumers prefer to have the tests made by a representative of the commission they can do so. For these referee tests a fee of from $2 to $8 per meter is charged depending upon the size of the meter. This fee is paid by the consumer if the meter is correct or slow and by the utility if the meter is more than 2 per cent fast. Meter readings and dates are required to be entered upon the bills so that consumers can verify them.

The gas must have an average of not less than 600 British thermal units per cubic foot and the minimum heat value should never fall below 550. The larger companies are all required to have calorimeter outfits for determining the heat value and to make these

determinations at least three days each week. The pressure must be kept within prescribed limits and each utility is required to make a survey of its system to demonstrate that the pressure conditions are satisfactory. The amount of sulphur and sulphureted hydrogen allowed in the gas is limited and the companies are required to keep a record of all complaints made regarding the service, together with the time the complaint is made, its nature, remedy and time of completing the work.

Electric utilities are required to maintain their meters correct within 4 per cent from one-tenth load to full load. These meters are required to be tested at installation and at intervals of from six to twenty-four months thereafter, depending upon the type and characteristics of the meter. Requirements similar to the gas rules are in force covering meter tests, records and billing. The utilities are required to make all reasonable effort to eliminate interruptions in service and are required to keep records of these interruptions and of the station operation. They are required to maintain the voltage throughout their systems within prescribed requirements and to make plans to demonstrate their compliance with these requirements. They are also required to inform consumers of conditions under which efficient service may be secured, and to render assistance in securing lamps and appliances best adapted to the service.

The inspections are brief, but cover the various items enumerated above. The inspectors usually complete an inspection in one or two days, but sometimes are obliged to spend a week or more in one place. The plan adopted consists of beginning the tests, if possible, before the inspector's presence is known. Before leaving, the inspector goes over the records of the utility, interviews the municipal and utility officials and consumers, follows up any irregularities reported in connection with the former inspection and by the aid of indicating and graphic recording instruments determines accurately the conditions prevailing at the time of the inspection. The inspector's report, together with maps, records and newspaper clippings, is sent to the office of the commission where the report is checked over and a letter is written to the utility giving the results of the inspection and calling attention to irregularities which may exist together with suggestions and recommendations when these seem necessary.

If the service is found to be inadequate and steps are not taken

to make proper improvements when these matters are taken up informally, the utility is notified to appear before the commission in a public hearing and show why the penalty for violating the orders of the commission should not be imposed. Frequently the improvements are made before the hearing or so soon thereafter that no further order or action is necessary. Sometimes orders to make specific improvements are issued, but it is seldom necessary to do so.

The efficiency of having state regulation of the service furnished by these utilities is particularly apparent in the case of gas inspections. In order to determine the heating value of gas a rather expensive and complicated testing outfit is required. It would be something of a burden for the individual cities to obtain an outfit of this kind together with a man to properly carry on the tests. In the state of Wisconsin there are thirty-six gas plants, which are regularly inspected by the commission's representative and this work is all done with one testing outfit which is shipped about the state in a trunk. As a matter of fact, the entire time of the one inspector has never been devoted to the inspection of gas service.

For the inspection of the service furnished by nearly three hundred electric plants, the state has been divided into districts. Four or five district inspectors are able to check up the quality of service furnished by these plants. These inspectors incidentally report on telephone service and extension matters, railway service, dangerous construction and operation, and other miscellaneous matters.

In order to administer these standards it is necessary to have a high grade of inspectors. In Wisconsin these men are all technically trained and in addition have had several years of practical experience. The inspectors keep in touch with the latest developments in the lighting business through the technical press and membership in technical societies. They attend conventions and have their own conferences semi-annually. A little over a year ago the standards laboratory at the state university was enlarged and is now run jointly by the university and the commission. Here the equipment of the commission's inspectors is kept in adjustment and that of the utilities, taken care of. Here also apparatus can occasionally be rented by utilities. This has facilitated to a considerable extent the inspection work.

It might be anticipated that this inspection work would be ex-

pensive, but this is not the case as will be seen from the analysis of costs of the work of the commission. Including supervision and general office and overhead expense of the engineering staff, stenographic work, railroad fare, express and repairs to equipment, the average cost of the gas inspections for the year ending June 30, 1913, was $35. This makes a total cost per city served for that year of approximately $65 for gas inspections. The electrical inspections made during that year cost about $26.50 each, and since those plants giving fairly adequate service were visited only once, the average cost per city visited did not exceed $34 for this year. The street lighting investigations made during this period are not included with the regular service inspection expense, as this work was rather elaborate and included research and experimental investigation. Many telephone service inspections were made, in which from 40 to 100 test calls showed the promptness and accuracy of operators, the conditions of maintenance and general adequacy of the service. The average cost of these inspections during the year was $27. With the revised standards for gas and electric service and definite standards for telephone service, still lower costs can be expected within the next few years.

The economy indicated by the above statements would not be possible except for the fact that the utilities are encouraged and required to criticise and inspect the quality of service they are furnishing, and to do the detail meter work themselves. The commission does not attempt to locate all places where irregular service conditions prevail, but leaves this responsibility with the utilities. The service now being furnished by the public utilities in Wisconsin is considerably better than what it was six years ago and is better than that in many neighboring states.